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**Unity of invention. The International Preliminary Examination Report does not mention a lack of unity of invention.**
**Nevertheless I elect the Group I (claims 2-12, 15-17 and 42-43) to which I add claims 14 and 18.**

**Addition of the claim 14**

There are often four phases in the life of a product: its manufacture, its transport, its use, and its destruction.

a) Transport phase

It is allowed that the product and its manufacture and/or its use can be grouped in the same inventive concept when the manufacturing process is specific to the product and essential to give him its qualities.

Transport must be able to form part of this same inventive concept when this transport is specific to the product, and/or **requires a specific quality** of the product.

In the present case, transport is a particularly important and difficult phase of the concept of big size membranous mirror telescope.

It is practically impossible to transport a membranous mirror (or an unspecified object) 20 meters in diameter without folding it, even if it is very light.

The possibility of folding without deterioration of the optical quality of the mirror is thus an essential element of the membranes (see the residual deformations of ISRS reflector, Aviation Week and Space Technologie/may 27, 1996, pages 58 and 59).

The shape memory is a practically essential quality of the membranes for obtaining and maintenance of quasi flatness according to claim 15.

This quasi flatness is essential for folding the mirror by rolling up.

This folding by rolling up is essential for the transport and the orbiting of the membranes without deterioration of optical qualities.

**b) manufacture phase**

The folding of a product can be regarded as the phase terminal of its manufacture or as the initial phase of its transport.

Into a general concept of savings, the maximum of characteristics is often introduced into the phase of manufacture; that avoids having to take again the product to give him an additional characteristic.

In an increasingly large number of cases, the phase of destruction and recycling of a product is even potentially integrated into the product as of its manufacture.

In this last case, the characteristics which are introduced into the product or the manufacturing process do not generate lack of unity of invention of the product and/or the process.

For example, the various layers of a packing and the various materials used in each layer, to ensure a certain quality AND the biodeterioration, will generally not be the subject of two patents.

It is reasonable to consider that an element of the phase of transport, in particular the folding of a product, can be integrated into the phase of manufacture without being the subject of an additional patent.

The shape memory being in our case a quasi essential element of folding, its introduction into the phase of manufacture should not be the subject of an additional patent.

Generally, the shape memory can bring a technical or economic advantage to all the products which must be folded AND unfolded at one unspecified time of their life.

But it cannot exist a specific patent monopolysing the use of ALL shape memory materials for ALL possible foldings.

It is reasonable to think that the shape memory will be the principal claim of a patent each time that it is essential in the use which is the finality of the product.

It is also reasonable to think that it can be integrated into a claim without being the subject of a particular patent when it is useful or necessary only in one phase preceding the phase of use of a particular product, for example its transport, as the biodeterioration which is useful or necessary only in the phase of destruction of the product.

**c) Absence of other use**

In addition, I do not see other reason with the use of a material with shape memory for the realization of a membranous paraboloïd, only the possibility of facilitating his folding according to claim 15.

**d) Two patents for the same invention**. If a patent was granted for the use of matter with shape memory to manufacture a parabolic membranous mirror, it was necessarly to allow distorting **AND** undistorting of this mirror, with maintenance of the distorting state during some time, **as in the claim 15**.

**Addition of claim 18.**

**a) Necessity of rotating liquid.** The membrane mirror must have an optical quality; it must thus be manufactured on an optical quality surface.

One cannot manufacture monolithic massive mirrors of more than 8 meters in diameter.

The only concave surface of optical quality of more than 8 meters in diameter is thus the surface of a rotating liquid.
The manufacture of the membranes by deposit of a substance on a revolving liquid thus forms part of the general inventive concept of the membranous mirror.
In addition, all the membranes which will be manufactured by deposit of a substance on a rotating liquid will have necessarily the shape of a paraboloïd, therefore of a membranous parabolic mirror.

**b) Absence of other use.** I do not see an other use of such a parabolic membrane.

**c) Two patents for the same invention.** If an independent patent was granted for a membrane obtained by depositing matter onto the surface of a rotating liquid, this patent shall be **necessarly** a patent for membranous parabolic mirror, actuating parabolic membrane, or safety parabolic membranous device.

**General unit of the inventive concept.**

Historically, it is the idea to manufacture a large membranous mirror by deposit on a revolving liquid which is at the origin of this telescope.
The second idea was to associate a membrane of control with the membranous mirror and to give a perfect form to the membrane mirror by electromagnetic actions between the two membranes.
The very difficult problem of handling, transport and orbiting was solved by claims 14 and 15.
The very great thinness and thus very great flexibility of the realizable membranes, and the essential precision of the form, forbade to solidarize the periphery of the membranes to a rigid structure; they were to thus be free with their peripheries and solidarized by their central areas.
The use of a tripod flexible frame solidarized with the periphery of the mirror, as in the ISRS, was thus not possible.
It necessarily resulted from this that the membranes could be solidarized with the frame only by their central areas.
To allow an overall movement of the mirror and actuating membrane at the time of the movements of orientation of the telescope, it was necessary to solidarize overall the actuating membrane and the frame via magnetic fields from the membrane and from the frame.
The various elements of the telescope necessarily joined and are all essential for its practical realization.
They thus belong to a single inventive concept.
One can notice moreover than apart from their meeting in the telescope described, they cannot have practical individual use.

**IMPROVED TELESCOPE**

**CLAIMS**

*(The parts in italic shall be deleted for examen on the merit)*

**1)** Space telescope comprising:

a) a first storey containing a membranous mirror and a mean actuating the shape of said mirror;

b) a second storey located at the focal plane of the mirror and containing means for observing the image;

c) a third storey located at the curvature center of the mirror, and containing means to explore the shape of the mirror;

*d) a accessory light device lighting the object scrutinized by the optical system;*

e) a mean joining the three stories *and the accessory light device;*

characterized in that:

f) the mirror and its actuating device are constituted by concentric membranes, free at their peripheries and tied by their central parts, directly or by a intermediate device;

g) the membranes, or only the actuating membrane, have surface devices, conductors, insulators, and semi conductors, separated, contiguous or stacked, constituting integrated circuits, and surface electrodes having particularly coils shape.

**2)** Telescope according to the claim 1, characterized in that a winding centered on the optical axis of the telescope surrounds the means of uniting the three stories at the level of the mirror storey, and/or where a wiring or a magnet with axis on same optical axis are tied to the mirror storey of said telescope.

**3)** Telescope according to claim 1, characterized in that the means tying the stories is a blind cylinder (2) rigidified by tubes under pressure and by polymerization of a resin impregnating the said cylinder and tubes.

**4)** Telescope according to claim 1, characterized in that the blind cylinder (2) tying the three telescope stories together is placed into a protecting jacket (3).

**5)** Telescope according to claim 1, characterized in that the blind cylinder (2) and the protecting jacket (3) are first folded by telescopic invagination then by folding spokes wise and scrolled along radiuses.

**6)** Telescope according the claim 1, characterized in that closed tubes associated by links to jacket (3) or to blind cylinder (2) of the telescope are folded by telescopic invagination at the same time as cylinder (2) or jacket (3), and have apertures through which a pressurized gas can be introduced to provoke their extension.

**7)** Telescope according to claim 1, characterized in that the blind cylinder (2) of the telescope (1) and the protecting jacket (3) are slightly conical or bi-conical.

**8)** Telescope according to claim 1, characterized in that windings symmetrically centered on the optical axis of the telescope (1) are fixed on the blind cylinder (2) at the level of the mirror storey.

**9)** Telescope according to claim 1 characterized in that the means of folding are made of linear vertical elements associated by pairs, vertically mobile from an upper position to a low position, and integral of radial displacement means, moving continuously from a position far from the center to a position closed to the center.

**10)** Telescope according to claim 1 characterized in that the mean recognizing the shape of the mirror, situated at the control stage and defining the optical axis of the mirror, moves inside a circle centered on the optical axis of the telescope, and perpendicularly to this axis.

**11)** Telescope according to claim 1, characterized in that the means adjusting the mirror and its actuating membrane are gimbal or ball-joint mounted, and provided with actuators.

**12)** Telescope according to claim 1, characterized in that the means controlling the mirror modify continuously the generating line of the mirror, while maintaining the shape of revolution of the mirror, in such a manner that at each instant exists a circle of minimum aberration centered on the optical axis and moving from the optical axis towards the outside or vice versa.

**14)** Telescope according to claim 1, characterized in that the mirror and its actuating membrane are made totally or partially of a material having shape memory.

**15)** Telescope according to claim 1, characterized in that, for their folding, the mirror and the actuating membrane are made quasi flat by a succession of centered distorsions, alternately concave and convex.

**16)** Telescope according to claim 1, characterized in that the means which unite the several stories is a tripod pyramidal frame the triangular base of which is contained within a circle distinctly smaller than the mirror.

**17)** Telescope according to claim 1, characterized in that the frame is made from flexible tubes having a complex annular structure comprising, going from the outside to the inside :

a) a textile layer for absorbing the solar radiation,

b) an insulating layer,

c) a textile layer impregnated with a resin curing under temperature or under the effect of a gas,

d) an exothermic coating reacting under the effect of a gas.

**18)** Telescope according to claim 1, characterized in that the membranes constituting the mirror and the actuating membrane are obtained by depositing a substance on a liquid contained in a vertical container rotating around its vertical axis.

**38)** Telescope according to claim 1, characterized in that, in the case of an open frame, protecting parabolic membranes, constituted of resin impregnated fibers, having peripheral flange exceeding flanges of the actuating membrane and mirror, are located beyond the said actuating membrane.

**42)** Telescope according to claims 1 and 41, characterized in that a cylindrical jacket, made of soundproofing materials, closed at its upper end by an optical membrane, is put under pressure in such a way as to stretch the optical membrane that closes it.

**43)** Telescope according to claim 1, characterized in that the envelope and the jacket are made of two separated elements, the upper cylindrical element, open and comprising the focal storey and the center of curvature storey, and the lower cylindrical element, closed at one end and comprising the mirror storey.